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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,195	02/13/2002	Haruo Fujiwara	1095.1211	5278

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EXAMINER	
WANG, QUAN ZHEN	
ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/073,195	FUJIWARA, HARUO	
	Examiner	Art Unit	
	Quan-Zhen Wang	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/13/02, 11/21/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara et al. (U.S. Patent US 6,804,469 B2) in view of Yokoyama (U.S. Patent US 6,658,211 B1) and further in view of Maroney (U.S. Patent US 6,681,079 B1).

2. Regarding claims 1, 13, and 15-16, Kasahara discloses an optical transmission system (fig. 1) which transports information over fiber-optic transmission lines of upstream and downstream links (column 5, lines 60-67 and column 6, lines 1-4), comprising: (a) an end station (fig. 1, TERMINAL STATION 1) comprising: monitoring signal transmission means (column 5, lines 43-59) for transmitting over the upstream link a monitoring request signal including a monitoring command signal with a first optical wavelength and a response carrier wave with a second optical wavelength which is different from the first optical wavelength, the monitoring command signal requesting a specified repeater to provide information about operating status thereof, the response carrier wave being a carrier wave for the specified repeater to return the requested information as a monitoring response signal, and operating status receiving means for

receiving the monitoring response signal and identifying the operating status of the specified repeater from the received monitoring response signal (column 3, lines 50-67 and column 4, lines 1-21; column 5, lines 43-59); and (b) a repeater (fig. 1, REPEATER 5; fig. 3, Supervisory Control Module 7) comprising: an upstream optical coupler (fig. 3, WDM Coupler 140), attached to the upstream link to extract the monitoring command signal from the monitoring request signal received through the upstream optical coupler; monitoring control means (fig. 3, Supervisory Control Module 7), responsive to the monitoring command signal supplied from the upstream wavelength selection means, for collecting information about operating status of the repeater, and encoding the collected information into a response message signal, monitoring response signal generating means, coupled to the monitoring control means, for producing a monitoring response signal by using an optical modulator to modulate the response carrier wave with the response message signal, the optical modulator using either of variable optical attenuation and tuned filtering techniques, modulation control means, coupled to the excitation means, for modulating the pump beam with the response message signal, whereby the response message signal is superimposed on the response carrier wave propagating on the upstream link and the resulting monitoring response signal reaches the upstream optical coupler, and a downstream optical coupler, attached to the downstream link, which has a port to accept the monitoring response signal from the second port of the upstream optical coupler and direct the monitoring response signal into the downstream link for delivery to the operating status receiving means in the end station (column 3, lines 50-67 and column 4, lines 1-27; column 6, lines 28-44).

Kasahara differs from the claimed invention in that Kasahara does not specifically teach a coupler selectively passing the first optical wavelength and reflecting back the second optical wavelength. However, this type of coupler is well known in that art, for example, Yoneyama teaches an optical coupler (fig. 4, coupler 4) with a wavelength selective reflector (fig. 4, Fiber Grating Filter 5), which can selectively passing the first optical wavelength and reflecting back the second optical wavelength. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a coupler selectively passing the first optical wavelength and reflecting back the second optical wavelength, such as the one taught by Yonyama, into the system taught by Kasahara in order to separate a signal having a special wavelength.

The Combined system by Kasahara and Yoneyama differs from the claimed invention in that Kasahara and Yoneyama do not specifically teach excitation means for supplying a pump beam into the fiber-optic transmission line of the upstream link to perform optical amplification using the fiber-optic transmission line as an amplifying medium. However, the technique to pump the optical transmission line to perform optical amplification using the transmission line as amplifying medium is well known in that art at the time when the invention was made. For example, Maroney teaches to pump (fig. 2, Raman Pump 15) the optical transmission line to amplify the optical signals in addition to a discrete optical amplifier (fig. 2, Fiber Amplifier 12). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to in corporate excitation means for supplying a pump beam into

the fiber-optic transmission line of the upstream link to perform optical amplification using the fiber-optic transmission line as an amplifying medium, as it is taught by Maroney, in the system of Kasahara and Yoneyama in order to improve the signal-to-noise ratio of the system.

3. Regarding claim 2, Yoneyama teaches that wavelength selection means is a fiber grating device which selectively reflects back the second optical wavelength.

4. Regarding claim 3, Kasahara further teaches modulation control means performs amplitude modulation (column 9, lines 29-32), thereby causing the response carrier wave to be amplitude-modulated.

5. Regarding claim 4, Maroney further teaches excitation means comprises a WDM coupler which supplies the modulated pump beam into the fiber-optic transmission line to perform either of forward pumping, backward pumping, and two-way pumping (fig. 2).

6. Regarding claim 5, Maroney further repeater further comprises an optical isolator (fig. 2, Isolator 14) disposed between the upstream optical coupler and WDM coupler.

7. Regarding claim 6, Maroney further teaches that the excitation means further performs erbium-doped fiber amplification (fig. 2, Fiber Amplifier 12).

8. Regarding claim 7, Kasahara further teaches that monitoring signal transmission means stops sending the response carrier wave when incoming optical transmission signals are available on the downstream link; and the excitation means further supplies the modulated pump beam into the fiber-optic transmission line of the downstream link,

whereby the response message signal is superimposed on the incoming optical transmission signals on the downstream link (inherent).

9. Regarding claim 8, Kasahara further teaches that modulation control means is configured with a variable modulation factor, including a maximum modulation factor to be applied when in out-of-service state (inherent).

10. Regarding claim 9, Kasahara and Yoneyama teach that the system further comprises a plurality of the repeaters, wherein: the each repeater further comprises a downstream wavelength selection means coupled to the downstream optical coupler; and the upstream and downstream wavelength selection means in the plurality of repeaters have the same reflecting wavelength (Kashara, fig. 1).

11. Regarding claim 10, Kasahara and Yoneyama teach that the system further comprises a plurality of the repeaters, wherein: each repeater further comprises a downstream wavelength selection means coupled to the downstream optical coupler; and the upstream and downstream wavelength selection means in the plurality of repeaters have different reflecting wavelengths from each other (Kasahara, fig. 1).

12. Regarding claim 11, Kasahara and Yoneyama teach that the system further comprises a plurality of repeaters, wherein: repeater further comprises a downstream wavelength selection means coupled to the downstream optical coupler; and the downstream wavelength selection means in the plurality of repeaters have a common reflecting wavelength that is different from what the upstream wavelength selection means reflect equally (Kasahara, fig. 1).

13. Regarding claim 12, Kasahara and Yoneyama further teach that the

information signals are wavelength-division multiplexed signals having wavelengths of $\lambda 1$- λn (inherent), Kasahara and Yoneyama does not further teach that the monitoring signal transmission means assigns either of the shortest wavelength $\lambda 1$, the longest wavelength $\lambda 1$, and an intermediary wavelength between two consecutive wavelengths λm and $\lambda m+1$ to the second optical wavelength. However, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to assigns either of the shortest wavelength $\lambda 1$, the longest wavelength $\lambda 1$, and an intermediary wavelength between two consecutive wavelengths λm and $\lambda m+1$ to the second optical wavelength in order to fully utilize the available resources.

14. Regarding claim 14, Kasahara and Yoneyama further teach that optical modulator is disposed between the second port of the upstream optical coupler and the downstream optical coupler (Kasahara, fig. 3).

15. Regarding claims 17-19, Kasahara teaches an optical transmission system (fig. 1) which transports information over fiber-optic transmission lines of upstream and downstream links (column 5, lines 60-67 and column 6, lines 1-4), comprising: (a) an end station (fig. 1, TERMINAL STATION 1) comprising: monitoring signal transmission means (column 5, lines 43-59) for transmitting over the upstream link a monitoring request signal including a monitoring command signal with a predetermined optical wavelength and a response carrier wave with the same predetermined optical wavelength, the monitoring command signal requesting a specified repeater to provide information about operating status thereof, the response carrier wave being a carrier

wave for the specified repeater to return the requested information as a monitoring response signal, and operating status receiving means for receiving the monitoring response signal and identifying the operating status of the specified repeater from the received monitoring response signal (column 3, lines 50-67 and column 4, lines 1-21; column 5, lines 43-59); and (b) a repeater (fig. 1, REPEATER 5; fig. 3, Supervisory Control Module 7) comprising: a first upstream optical coupler (fig. 3, WDM Coupler 138), attached to the upstream link, which has a first port for splitting off a part of upstream transmission signals, including the monitoring request signal, and a second port for taking out an optical signal that enters the first port, an upstream wavelength reflection means, coupled to the first port of the first upstream optical coupler, for selectively reflecting back the predetermined optical wavelength, a second upstream optical coupler (fig. 3, WDM Coupler 140), attached to the upstream link, for receiving the monitoring command signal, monitoring control means, responsive to the monitoring command signal received by the second upstream optical coupler, for collecting information about operating status of the repeater, and encoding the collected information into a response message signal, excitation means for supplying a pump beam into the fiber-optic transmission line of the upstream link to perform optical amplification using the fiber-optic transmission line as an amplifying medium, modulation control means, coupled to the excitation means, for modulating the pump beam with the response message signal, whereby the response message signal is superimposed on the response carrier wave propagating on the upstream link and the resulting monitoring response signal reaches the first upstream optical coupler, and a

downstream optical coupler, attached to the downstream link, which has a port to accept the monitoring response signal from the second port of the first upstream optical coupler and direct the monitoring response signal into the downstream link for delivery to the operating status receiving means in the end station (column 3, lines 50-67 and column 4, lines 1-27; column 6, lines 28-44).

Kasahara differs from the claimed invention in that Kasahara does not specifically teach a coupler selectively passing the first optical wavelength and reflecting back the second optical wavelength. However, this type of coupler is well known in that art, for example, Yoneyama teaches an optical coupler (fig. 4, coupler 4) with a wavelength selective reflector (fig. 4, Fiber Grating Filter 5), which can selectively passing the first optical wavelength and reflecting back the second optical wavelength. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a coupler selectively passing the first optical wavelength and reflecting back the second optical wavelength, such as the one taught by Yonyama, into the system taught by Kasahara in order to separate a signal having a special wavelength.

The Combined system by Kasahara and Yoneyama differs from the claimed invention in that Kasahara and Yoneyama do not specifically teach excitation means for supplying a pump beam into the fiber-optic transmission line of the upstream link to perform optical amplification using the fiber-optic transmission line as an amplifying medium. However, the technique to pump the optical transmission line to perform optical amplification using the transmission line as amplifying medium is well known in

that art at the time when the invention was made. For example, Maroney teaches to pump (fig. 2, Raman Pump 15) the optical transmission line to amplify the optical signals in addition to a discrete optical amplifier (fig. 2, Fiber Amplifier 12). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to in corporate excitation means for supplying a pump beam into the fiber-optic transmission line of the upstream link to perform optical amplification using the fiber-optic transmission line as an amplifying medium, as it is taught by Maroney, in the system of Kasahara and Yoneyama in order to improve the signal-to-noise ratio of the system.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wakabayashi et al. (U.S. Patent US 4,300,239) and Wakabayashi et al. (U.S. Patent US 4,313,224) disclose optical repeater monitoring systems. Fugiwara et al. (U.S. Patent US 5,274,496) disclose an optical repeater with monitor and control function. Takahashi et al. (U.S. Patent US 5,296,957) disclose an optical repeater having loop-back function used in transmission. Ohta et al. (U.S. Patent US 5,737,105) disclose an optical repeater. Sugiyama et al. (U.S. Patent US 5,883,735) disclose an optical repeater. Shigematsu et al. (U.S. Patent US 6,259,553 B1) disclose an optical amplifier repeater system. Maddocks et al. (U.S. Patent US 6,483,616 B1) disclose an optical communication system with safe repeaters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 8:30 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

qzw

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